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REMARKS

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application is respectfully requested.

Applicants assert that the present invention is new, non-obvious and useful. Prompt consideration and allowance of the claims is respectfully requested.

Status of Claims

Claims 1-34 are pending. Claims 1-34 have been rejected. Claims 1, 2, 5, 7, 8, 10, 13-20, 22, 24, 27, 30-32 and 34 have been amended.

Claims 4, 21, 25 and 33 have been canceled without prejudice or disclaimer. In making this cancellation without prejudice, Applicants reserve all rights in these claims to file divisional and/or continuation patent applications.

Claims 2, 5, 7, 8, 10, 13-18, 20, 24, 27, 30-32 and 34 have been voluntarily amended to correct typographical errors or for clarification only. This amendment does not narrow the scope of the claim, nor is it being made for reasons of patentability. The amended claim is not subject to the complete bar against the use of the Doctrine of Equivalents as outlined in Festo Corporation v. Shoketsu Kinsoku Kogyo Kapushiki Co., Ltd. a/ka/ SMC Corporation and SMt Pneumatics, Inc., as the amendment does not narrow the scope of the claim, nor is it being made for reasons of patentability.

Applicants respectfully assert that the amendments to the claims and specification add no new matter.

Remarks to the Title

In the Office Action the Examiner objected to the Title because of it allegedly not being descriptive. The title is amended to be: VERTICAL COMB DRIVE AND METHOD OF PRODUCING THE SAME. The Applicants assert that this title is descriptive.

Remarks to the Specification

The amendments to the specification are editorial in nature and do not introduce new matter.

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In the paragraph starting on page 7 line 9, the term "optical location" (line 21), which was mistyped, was amended to read "optimal location".

In the paragraph starting on page 7 line 28, the word "whereas" (line 28), which was mistyped, was amended to read "wherein".

In the two adjacent paragraphs starting on page 8 line 16, the word "whereas" (line 17), which was mistyped, was amended to read "wherein". Numerals 30 (appearing in line 18, 24 and 27) were deleted.

Applicants assert that no new subject matter was added.

CLAIM REJECTIONS

35 U.S.C. § 102 Rejections

In the Office action, the Examiner rejected claims 1-3, 10, 17, 19, 20, 27 and 33 under 35 U.S.C. § 102(b), as being anticipated by Turner (US 6,497,141). Applicants respectfully traverse this rejection at least in view of the remarks that follow.

Turner describes, inter-alia, comb drives which may be driven at parametric frequencies to provide stable operation and to permit precise switching between stable and unstable operations by very small changes in the drive frequency or by very small changes in the characteristics of the structure itself so as to provide improved control and sensing.

Turner does not teach or suggest a method for producing a vertical comb drive which includes fabricating a rotor comb element, and at least one stator comb element, repositioning said at least one stator comb element with respect to the rotor comb element so as to establish an elevation gap between an external surface of said at least one stator comb element and a corresponding external surface of the rotor comb element; and fixing the repositioned rotor comb element and said at least one stator comb element to each other at a rotation axis, as it is claimed in amended independent claim 1 (and corresponding device, as claimed in amended independent claim 19).

Therefore, Applicants assert that amended independent claims 1 and 19 are allowable.

Claims 2, 3, 10 and 17 depend, directly or indirectly, from amended independent claim 1, and claims 20 and 27 depend, directly or indirectly, from amended independent claim 19, and therefore include all the limitations of the base claim.

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Therefore, Applicants assert that claims 2, 3, 10, 17, 20 and 27 are allowable too.

Claim 33 has been canceled.

Applicants respectfully request reconsideration and withdrawal of the rejections to claims 1-3, 10, 17, 19, 20 and 27.

35 U.S.C. § 103 Rejections

In the Office action, the Examiner rejected claims 4 and 21 under 35 U.S.C. § 103(a), as being unpatentable over Turner in view of Jerman et al. (US 5,998,906).

Applicants respectfully traverse this rejection at least in view of the remarks that follow.

Claims 4 and 21 have been canceled and rendering this rejection moot.

In the Office Action, the Examiner rejected claims 5, 6, 22 and 23 under 35 U.S.C. § 103(a), as being unpatentable over Turner in view of Yu et al. (US 20020012180).

Applicants respectfully traverse this rejection at least in view of the remarks that follow.

Applicants respectfully traverse the rejection because a prima facie case of obviousness has not been established.

The combination of Turner and Yu et al. does not teach or suggest all the limitations of amended independent claim 1 or amended independent claim 19, nor does it teach or suggest all the limitations of dependent claims 5, 6, 22 and 23.

Yu describes a micro machined mirror assembly that includes a micro machined top cap, mirror, and bottom cap mounted onto a ceramic substrate. The micro machined mirror is resiliently supported by a pair of T-shaped hinges. At least two electrostatic force application pads are disposed to rotate the mirror about a primary axis and about a secondary axis.

Turner has been discussed above. That discussion is applicable here.

Yu et al. is also silent as to "repositioning said at least one stator comb element with respect to the rotor comb element so as to establish an elevation gap between an external surface of said at least one stator comb element and a corresponding external surface of the rotor comb element; and fixing the repositioned rotor comb element and said at least one stator comb element to each other at a rotation axis", as it is claimed in

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amended independent claim 1 (and corresponding device, as claimed in amended independent claim 19, and therefore cannot cure the deficiencies of Turner.

Claims 5 and 6 depend, directly or indirectly, from amended independent claim 1, and claims 22 and 23 depend, directly or indirectly, from amended independent claim 19, and therefore include all the limitations of the base claim.

Therefore, Applicants assert that claims 5, 6, 22 and 23 are allowable too.

Applicants respectfully request reconsideration and withdrawal of the rejections to claims 5, 6, 22 and 23

In the Office action, the Examiner rejected claims 7-9 and 24-26 under 35 U.S.C. § 103(a), as being unpatentable over Turner in view of Hopkins et al. (US 20030082917).

Applicants respectfully traverse this rejection at least in view of the remarks that follow.

Hopkins et al. describe a method of fabricating a vertical actuation comb drive first etches a cavity in a semiconductive wafer; then the comb structure is etched, and the fixed part of the structure is deformed by an induced strain, by techniques such as boron doping, by adding a metal layer or a fixed oxide, or a mechanical latch or an additional plate electrode. In a manner known in the art, application of a voltage across the fingers of the comb produces a deflection either tilting or a vertical movement in the moveable portion of the comb drive.

Turner has been discussed above. That discussion is applicable here.

Hopkins et al. is also silent as to "repositioning said at least one stator comb element with respect to the rotor comb element so as to establish an elevation gap between an external surface of said at least one stator comb element and a corresponding external surface of the rotor comb element; and fixing the repositioned rotor comb element and said at least one stator comb element to each other at a rotation axis", as it is claimed in amended independent claim 1 (and corresponding device, as claimed in amended independent claim 19, and therefore cannot cure the deficiencies of Turner.

Claims 7-9 depend, directly or indirectly, from amended independent claim 1, and claims 24 and 26 depend, directly or indirectly, from amended independent claim 19, and therefore include all the limitations of the base claim. Claim 25 has been canceled.

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Therefore, Applicants assert that claims 7-9, 24 and 26 are allowable too.

Applicants respectfully request reconsideration and withdrawal of the rejections to claims 7-9, 24 and 26.

In the Office action, the Examiner rejected claims 11, 12, 28 and 29 under 35 U.S.C. § 103(a), as being unpatentable over Turner in view of Yamada et al. (US 5,959,760).

Applicants respectfully traverse this rejection at least in view of the remarks that follow.

Yamada et al. discloses a light beam scanner which includes a supporting substrate. Fixed electrodes of a first set are provided on the supporting substrate to oppose to each other. A mirror is provided between the fixed electrodes, has torsion bars physically connected to the supporting substrate and a mirror electrode section in end portions of the mirror opposing to the fixed electrodes at least. The mirror rotatably vibrates between an upper position of the one fixed electrode and a lower position thereof by torsion force of the torsion bars and electrostatic force due to the voltage using the torsion bars as a rotation axis, when a voltage is applied between one of the fixed electrodes and the electrode section.

Turner has been discussed above. That discussion is applicable here.

Yamada et al. is also silent as to "repositioning said at least one stator comb element with respect to the rotor comb element so as to establish an elevation gap between an external surface of said at least one stator comb element and a corresponding external surface of the rotor comb element; and fixing the repositioned rotor comb element and said at least one stator comb element to each other at a rotation axis", as it is claimed in amended independent claim 1 (and corresponding device, as claimed in amended independent claim 19, and therefore cannot cure the deficiencies of Turner.

Claims 12 and 12 depend, directly or indirectly, from amended independent claim 1, and claims 28 and 29 depend, directly or indirectly, from amended independent claim 19, and therefore include all the limitations of the base claim.

Therefore, Applicants assert that claims 11, 12, 28 and 29 are allowable too.

Applicants respectfully request reconsideration and withdrawal of the rejections to claims 11, 12, 28 and 29.

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In the Office action, the Examiner rejected claims 13 and 30 under 35 U.S.C. § 103(a), as being unpatentable over Turner in view of Suzuki et al. (US 5,554,304).

Applicants respectfully traverse this rejection at least in view of the remarks that follow.

Suzuki et al. describes a micromotion mechanical structure, such as a vibration-type sensor or a step motor, which includes at least one fixed electrode and at least one movable electrode which is moved by electrostatic power applied to the fixed electrode, at least one of the electrodes is formed essentially by a single crystal semiconductor material. The single crystal semiconductor material has various merits of uniform mechanical properties, small internal stress, etc. for use in such electrodes. Such structure has been realized by attaching patterned electrode made of the material to another substrate and then removing or thinning the original substrate carrying the patterned electrodes.

Turner has been discussed above. That discussion is applicable here.

Suzuki et al. is also silent as to "repositioning said at least one stator comb element with respect to the rotor comb element so as to establish an elevation gap between an external surface of said at least one stator comb element and a corresponding external surface of the rotor comb element; and fixing the repositioned rotor comb element and said at least one stator comb element to each other at a rotation axis", as it is claimed in amended independent claim 1 (and corresponding device, as claimed in amended independent claim 19, and therefore cannot cure the deficiencies of Turner.

Claim 13 depends, directly or indirectly, from amended independent claim 1, and claim 30 depends, directly or indirectly, from amended independent claim 19, and therefore these claims include all the limitations of the base claim.

Therefore, Applicants assert that claims 13 and 30 are allowable too.

Applicants respectfully request reconsideration and withdrawal of the rejections to claims 13 and 30.

In the Office action, the Examiner rejected claim 16 under 35 U.S.C. § 103(a), as being unpatentable over Turner in view of Mao et al. (US 6,771,001).

Applicants respectfully traverse this rejection at least in view of the remarks that follow.

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Mao et al. discloses an electrostatic comb drive suitable for micro-electro-mechanical systems ("MEMS") application uses shaped fingers to achieve bi-directional actuation from a unipolar actuation pulse. The finger shape also provides auto-braking of the movable member of the drive using a simple actuating pulse. In a further embodiment, an end stop inhibits overshoot and a back spring pushes the movable portion of the device back toward an operating position. In yet a further embodiment, a Vernier scale is provided on the movable portion of the drive relative to the fixed portion of the drive to indicate relative shift of these portions after the device is fabricated.

Turner has been discussed above. That discussion is applicable here.

Mao et al. is also silent as to "repositioning said at least one stator comb element with respect to the rotor comb element so as to establish an elevation gap between an external surface of said at least one stator comb element and a corresponding external surface of the rotor comb element; and fixing the repositioned rotor comb element and said at least one stator comb element to each other at a rotation axis", as it is claimed in amended independent claim 1 (and corresponding device, as claimed in amended independent claim 19, and therefore cannot cure the deficiencies of Turner.

Claim 16 depends, directly or indirectly, from amended independent claim 1, and therefore include all the limitations of the base claim.

Therefore, Applicants assert that claim 16 is allowable too.

Applicants respectfully request reconsideration and withdrawal of the rejection to claim 16.

In the Office action, the Examiner rejected claims 14, 15, 18, 31, 32 and 34 under 35 U.S.C. § 103(a), as being unpatentable over Turner in view of Yamada et al. (US 5,959,760).

Applicants respectfully traverse this rejection at least in view of the remarks that follow.

Neither Turner nor Yamada, alone or in combination, disclose all of the limitations of amended independent claims 1 and 19.

Claims 14, 15 and 18 depend, directly or indirectly, from amended independent claim 1, and claims 31, 32 and 34 depend, directly or indirectly, from amended independent claim 19, and therefore include all the limitations of the base claim.

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Therefore, Applicants assert that claims 14, 15, 18, 31, 32 and 34 are allowable too.

Applicants respectfully request reconsideration and withdrawal of the rejections to claims 14, 15, 18, 31, 32 and 34.

Conclusion

In view of the foregoing amendments and remarks, Applicants assert that the pending claims are allowable. Their favorable reconsideration and allowance is respectfully requested.

Should the Examiner have any question or comment as to the form, content or entry of this Amendment, the Examiner is requested to contact the undersigned at the telephone number below. Similarly, if there are any further issues yet to be resolved to advance the prosecution of this application to issue, the Examiner is requested to telephone the undersigned counsel.

Please charge any fees associated with this paper to deposit account No. 50-3355.

Respectfully submitted,



Zeev Pearl
Attorney/Agent for Applicant(s)
Registration No. 60,234

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Pearl Cohen Zedek Latzer, LLP
1500 Broadway, 12th Floor
New York, New York 10036
Tel: (646) 878-0800
Fax: (646) 878-0801